

Copyright  
by  
Daniel St. Clair Kreitzberg  
2016

**The Thesis Committee for Daniel St.Clair Kreitzberg  
Certifies that this is the approved version of the following thesis:**

**Influence of Alcohol Advertising on Intention to Use Alcohol  
among College Students**

**APPROVED BY  
SUPERVISING COMMITTEE:**

**Supervisor:**

---

Keryn Pasch

---

Alexandra Loukas

**Influence of Alcohol Advertising on Intention to Use Alcohol  
among College Students**

**by**

**Daniel St.Clair Kreitberg, B.S**

**Thesis**

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

**Master of Science in Health Behavior and Health Education**

**The University of Texas at Austin**

**May 2016**

## **Dedication**

I would like to dedicate my thesis to my lovely wife Amber Kreitzberg, my parents, Mike and Dawn Kreitzberg, my sister Tiffany, and my two brothers Patrick and Paul. To my loving grandparents Roy and Gayle Nelson and George and Laura Kreitzberg, I am so lucky to have had you as grandparents. Additionally, to all of my aunts, uncles, and cousins! To the memory of Angela Uzcanga and her loving family Marcos, Gloria, Pelon, and Esteban for so much support. To Jason, Jessica, Henry, Oliver, and Vivian. To the Martins and Prows for being my second families. To the memories of my friends Jayson and Brian for reminding me of how lucky I am. To my babies Josh, Heidi, Rusty, Bear, Otis, Nico, Luna, and Sol. To my friends including Franky, Ben & Kim, Mahoney, Cody, David, Zach & Jacqui, Jake, Bill, the warehouse crew, Damon, Frank, Nick, Erik, Peter, Barrett, Zach, Jamal, Kunal, Croak, Alex, Brian, Sam, DJ, Stu, Aaron, Dvav, Smo, Gram, Half Gram, Skylar, Reed, Shauna, Mitchell, Brenden, and so many more. Thanks so much to my cohort and grad school family including Kelsey, Teresa, Ana, Stephanie, Sam, Deepti, Kelene, Taylor, Matt, Natalie G, Vanessa, Hannah, Alejandra, Shelly, Yen, Cali, Elizabeth, Emily, and Tres.

## **Acknowledgements**

Thank you so much to my lovely wife, Amber Kreitzberg. You have been there through thick and thin and always lent your ear and feedback throughout the past two years and more importantly, our entire relationship. Thanks for raising our babies while I work away on the computer and for your understanding when I am flustered to make a deadline. Thanks to Keryn Pasch for all the feedback and guidance throughout the past two years. It has been wonderful working with you and thank you for believing in me. Thanks also to Alex Loukas for all of the feedback and opportunities. To my parents, Mike and Dawn Kreitzberg, my siblings Tiffany, Patrick, and Paul, for supporting, encouraging, and celebrating with me through undergraduate and into my graduate studies. Thanks to my wonderful grandparents, Roy and Gayle Nelson, and my late grandparents George and Laura Kreitzberg for their kind words and love and support of my career. Thanks also to my colleagues in graduate school for all of the understanding and support anyone could ask for. I am very thankful to call them all my friends.

May 6<sup>th</sup> 2016

## **Abstract**

### **Influence of Alcohol Advertising on Intention to Use among College Students**

Daniel St.Clair Kreitzberg, M.S.H.B.H.Ed.

The University of Texas at Austin, 2016

Supervisor: Keryn E. Pasch

**Background:** There is little experimental research examining the influence of televised alcohol commercials on young adults' alcohol use intentions. The aim of this study was to examine the influence of alcohol commercials on the attitudes and intentions to use alcohol among college students.

**Methods:** A sample of 100 undergraduate students (18 to 25 years) viewed a popular half-hour television show with four alcohol commercials within advertising blocks. The participants completed pretest and posttest surveys measuring their intentions and attitudes. Separate Paired-Samples T-tests and non-parametric Wilcoxon Signed Rank tests were conducted to test for change in average levels of intentions and attitudes after exposure to alcohol commercials. Analyses were conducted with and without one outlier on the intention item in order to gain a full understanding of our findings. Missing data ranged from 1% to 3%, therefore, individual models vary in sample size.

**Results:** A majority of the participants were female (72%), one third were white (34%), and the average age was 21 years old. Approximately 75% of our sample had at least one drink in the past 30 days (40% of these students were underage  $n=30$ ). Results of the Paired-Samples t-tests and Wilcoxon Signed Rank tests indicated a statistically significant increase in intentions to use alcohol in the next 30 days ( $p<0.05$ ). Additional analyses that excluded the outlier resulted in non-significant findings, although findings approached significance ( $p<0.09$ ). Of the reasons to use alcohol, only “to feel less stressed” decreased significantly.

**Conclusion:** This study examined the influence of televised alcohol advertising on young adult’s attitudes and intentions using an experimental design. Of the attitude measures, only “to feel less stressed” changed significantly and this change was in the opposite direction hypothesized. However, our results suggest alcohol commercials increase intentions to use alcohol among college students. These findings are important as young adults may be exposed to many more alcohol commercials in a sitting than were included in the present study. This study likely underestimates the influence of televised alcohol commercials on intentions to use alcohol. Future research should expand attitude items and include a greater variety of alcohol commercials.

Word count: 349

## Table of Contents

List of Tables .....	ix
Background .....	1
Methods.....	<b>7</b>
Results.....	11
Discussion .....	14
References.....	18



## **List of Tables**

<b>Table 1. Demographic characteristics and past 30 days alcohol consumption of participants.....</b>	<b>11</b>
<b>Table 2. Paired Sample T-Test &amp; Wilcoxon Signed Rank Test.....</b>	<b>13</b>

## **Background**

Alcohol use during young adulthood remains widespread within the United States. According to the Substance Abuse and Mental Health Services Administration (SAMHSA, 2013) 54.1% of persons aged 18-22 used alcohol and 35.6% reported binge drinking (5 or more for men or 4 or more drinks for women within a two hour period) during the past month. Additionally, past month use nearly doubles from the age of 18 to the age of 22 (35.1% and 70%, respectively; SAMHSA, 2013). While not all alcohol drinking behavior is detrimental, alcohol use may cause adverse outcomes, particularly for those whose brains are still developing like young adults (Lebel & Beaulieu, 2011).

Many health and behavioral outcomes are associated with binge drinking among young adults. College students who report binge drinking are at risk for engaging in unplanned sexual activity (Townshend et al. 2014), injury, suicide, property damage, involvement with law enforcement, alcohol abuse and dependence, driving drunk, and unsafe sex (White & Hingson, 2014; Wechsler et al. 1994). Sustained patterns of binge drinking, for 2 or more years, have been linked to anomalies in neural activity during attention and memory processing tasks among young adults which inhibit cognitive functioning (López-Caneda et al., 2013). Cognitive malfunctioning is important as it may also lead to poor academic performance (Perkins, 2002) and academic problems (Wechsler, Lee, Kuo, & Lee, 2000). Many factors such as social anxiety (Norberg, Norton, Olivier, & Zvolensky, 2010), drinking to improve social interactions (Ham, 2009; LaBrie, Hummer, & Pedersen, 2007), social conformity (O'Hara & Armeli, 2015),

mood enhancement (O'Hara & Armeli, 2015), and tension reduction (LaBrie, Hummer, & Pedersen, 2007) have been associated with alcohol use among young adults. Alcohol advertising is one understudied factor that may be particularly important to examine as it is pervasive (Bonnie & O'Connell, 2004) and may influence attitudes and perceptions that then influence alcohol use (Fleming, Thorson, & Atkin, 2004; Austin, Chen, & Grube, 2006; Smith & Foxcroft, 2009) among young adults.

Alcohol advertising and portrayals of use are common in television (TV), film, music and music videos (Bonnie & O'Connell, 2004), and exposure has been linked to alcohol use (Austin et al., 2006; Ross et al., 2015; Anderson et al., 2009). In a review of 13 longitudinal studies, Anderson and colleagues (2009) examined 12 studies that found that alcohol marketing exposure, among adolescents, predicted alcohol use initiation for non-users and/or increased use among current users. Further, in a systematic review of seven cohort studies (total n over 13,000) Smith and Foxcroft (2009) reported consistent findings linking exposure to alcohol advertisements to alcohol use among youth and young adults (10 to 26 years old).

While several studies have linked exposure to alcohol marketing to alcohol use, a variety of different methods have been used to measure exposure. Specifically, alcohol marketing has been measured as exposure to alcohol products or advertisements in movies (Wills et al., 2009; Sargent et al., 2006); outdoor advertisements (Pasch et al., 2007); TV commercials (Fisher et al., 2007); radio (Snyder et al., 2006); magazines (Snyder et al., 2006); billboards (Snyder et al., 2006); and music video TV programs (Van den Bulck & Beullens, 2005); as well as ownership of alcohol branded merchandise

(McClure et al., 2009) and brand recall and recognition (Henriksen et al., 2008).

However, only a few studies have focused on young adults (Snyder et al., 2006; Engels et al., 2009; Kuo, Wechsler, Greenberg, & Lee, 2003). Given consistent findings that link exposure to alcohol advertising and alcohol use, it is important to consider the process by which advertisements influence viewer's perceptions, particularly among young adults.

Exposure to alcohol advertising likely influences attitudes and beliefs about alcohol use that, in turn, influence intentions to use alcohol. The Theory of Planned Behavior (TPB; Ajzen, 1985) suggests that attitudes and beliefs influence intentions which then influences behavior. An alcohol advertisement, therefore, may influence an individual's beliefs and attitudes and thereby influence their intention to drink the given product and thus increase the likelihood that they will use alcohol. One model that suggests how alcohol advertising may influence attitudes is the Elaboration Likelihood Model (ELM). According to ELM, exposure to advertisements may influence attitudinal change through two routes of persuasion, the central or the peripheral (Petty, Cacioppo, & Schumann, 1983). The central route alters attitudes through attentive elaboration (focused cognitive processing) of the information received from an advertisement and the advertisement's fit with the previously established attitudes that may be based on experiences and knowledge (Petty et al., 1983). This suggests that an individual watching TV who focuses his/her attention on an advertisement's message may be more persuaded by that message, resulting in either a positive or negative attitude change. Further, previous experience with or knowledge about a product may increase the likelihood of elaboration. For example, a viewer may have a previously established attitude toward the

taste of a brand of beer, and the focus of an advertisement on taste may result in greater persuasion.

Exposure to alcohol advertisements may also influence young adult attitudes through the peripheral route of persuasion. Similar to the central route, the peripheral route influences attitudinal change through exposure to positive (e.g., pleasant music) or negative (e.g., annoying narrator) cues (Petty et al., 1983). For example, if a commercial features a preferred song or attractive person, an individual may be persuaded by that commercial to change his/her attitude toward the product even if s/he is distracted during the commercial break. Additional factors, such as motivation and ability to engage in elaboration, influence the depth of elaboration after exposure to an advertisement (O'Keefe, 2013). Given that TV commercials are commonly viewed and allow alcohol advertisers an ability to reach many young adults simultaneously (Ross et al., 2015), it is important to consider the process by which exposure may influence attitudes and intentions. The TPB (Ajzen, 1985) and ELM (Petty et al., 1983) both help elucidate the process by which exposure to alcohol advertising may influence young adults' attitudes and intentions.

One prevalent form of alcohol advertising that may influence attitudes and intentions among young adults is TV commercials. The alcohol industry spends a great deal of money advertising through TV. Industrywide, \$7.5 billion dollars were spent between 2005 and 2012 placing over 2.4 million alcohol advertisements on TV (Ross et al., 2015). Televised alcohol advertisements are designed with the goal of increasing market share through creating positive emotional associations with the brands (Saffer,

2002). Specifically, advertisers sell the idea that for a small amount of money the viewer may experience the fantasy life, personality, and place characterized in the advertisement. Alcohol TV advertisements commonly include humorous content, friends, and sports as well as messages promoting alcohol as relaxing and sexy while emphasizing quality, masculinity, taste, luxury, and tradition (Morgenstern et al., 2015). Many of these characteristics may create positive thoughts and feelings towards the brand. Previous research has tied TV advertisement exposure to alcohol use, however, these studies primarily include adolescents and largely rely on recall (Connolly et al., 1994; Stacy, Zogg, Unger, & Dent, 2004) or estimates of exposure based on reported TV viewing (Strickland, 1984; Robinson, Chen, & Killen, 1998; Stacy, Zogg, Unger, & Dent, 2004; Van den Bulck & Beullens, 2005). While these studies are not experimental, consistent findings support a causal relationship between exposure and intention to use alcohol. However, in their review, Smith and Foxcroft (2009) suggest that despite strong cohort study evidence, further research is needed to examine the causal impact of advertising exposure.

While longitudinal studies may suggest a causal link between exposure and use (Wills et al., 2009) experimental designs are another method that allow for causal relationships to be established. However, few studies have used experimental methods to investigate the relationship between advertising and alcohol use intentions particularly among young adults. In one study using an experimental approach, Engels (2009) examined drinking behavior in Dutch young adult male students ( $n=80$ ,  $mean=21$ ) using four different experimental conditions (a movie with alcohol use and both neutral and

alcohol commercials, a movie with alcohol use and neutral commercials, a movie without alcohol use and a mixture of neutral and alcohol commercials, and a movie without alcohol use and neutral commercials). While viewing the movie, participants were able to order and drink alcohol. Participants who watched movies that included alcohol use portrayals and commercials for alcohol consumed more drinks during the sitting than did their peers in the other condition groups. Engels and colleagues (2009) were able to find evidence of a causal relationship between exposure to alcohol advertising and alcohol use with an experimental design. However, pre- and posttest surveys to measure shifts in attitudes or intentions before and after viewing were not included, alcohol commercials on TV were not used as the exposure, and the participants were of age with ready access to alcohol. As such, further experimental studies examining the influence of TV alcohol advertisements on young adults in the U.S. are needed.

To our knowledge, no study has used a pre/post-test experimental design to examine exposure to alcohol commercials embedded within a TV show to determine the influence of this type of alcohol marketing exposure on attitudes toward alcohol and intentions to use alcohol among young adults. Moreover, our study used a TV program that is popular among young adults and alcohol TV commercials that are nationally aired. Our study adds to the literature by examining short term influences of alcohol advertising during a typical experience of watching TV. We hypothesize that both intentions and positive attitudes for reasons to use alcohol will increase after exposure to the televised alcohol commercials.

## **Methods**

### *Procedure*

Data used in the present analysis are part of a larger study assessing the effect of exposure to electronic cigarette commercials (e-cigarettes) on young adult's attitudes, perceptions, and intentions. Participants included undergraduate university students from a large university in the southwestern United States. Participants were recruited through an online campus wide event listings page as well as physical fliers posted around campus. Research staff conducted phone screening surveys to determine participation eligibility with a short series of questions. The short screener included questions about tobacco use, e-cigarette use, sleep patterns, eating behaviors, TV watching, and demographics so that the participants were not altered to the focus of the study. Participants were excluded if they had ever tried e-cigarettes, if they were not currently enrolled undergraduates, and if they were not between 18 and 25 years old. If students were determined to be eligible, they were scheduled to participate in the study.

During the study, students were asked to complete a pretest, a distraction task, view a popular half-hour TV show, complete a second distraction task, and lastly, finish a post-survey. Surveys were hosted by Qualtrics (2015), a web-based survey platform, and were completed on a laptop. Distraction tasks included a cross word puzzle as well as a memory task (i.e., filling in a blank map of the United States with state names). Both distraction tasks were timed for a maximum of 5 minutes for completion. The Big Bang Theory TV show was selected for our study based on its popularity within our sample demographic. Commercials were shown during normal commercial breaks (4 blocks) as



would be experienced if viewed on TV. In order to select relevant commercials, research assistants evaluated frequency of commercials aired during the Big Bang Theory and fifteen commercials for the most commonly aired products were chosen along with five e-cigarette commercials. Commercials included five e-cigarette advertisements, five junk food advertisements, four alcohol advertisements (two beer and two liquor), three sugar sweetened beverage advertisements, two skin care products, and an electronics advertisement. Commercials were distributed across four blocks. The order of commercials were arranged within commercial blocks so that each product type did not appear in the same position between blocks. Participants viewed the TV show on a computer monitor. Data were collected between the Fall of 2014 and Summer of 2015.

### *Measures*

*Intention to use alcohol.* Intention to use alcohol in the next 30 days was assessed with a single item asking the participant to indicate if he or she will drink alcohol in the next 30 days. The item asked, “Do you think you will use any of the following in the next 30 days? - Alcohol” Response options included “Definitely Not”=1, “Probably Not”=2, “Probably Yes”=3, and “Definitely Yes”=4.

*Perceived reasons to use.* Perception of the appropriateness of reasons to drink alcohol was assessed with a single statement, “The following are reasons why people your age may use alcohol. Please rate the appropriateness of each of the following reasons.” The possible answer choices included, “As a reward for working hard,” “To have a good time with friends,” “To celebrate,” “Be outgoing in a social situation,” “Feel connected with the people around me,” and “Feel less stressed”. Each of the statements

were independently answered on a 7 point Likert scale from “Not at all appropriate” (1) to “Extremely Appropriate” (7).

*Past 30 days use.* Alcohol consumption in the past 30 days was measured with a single item during the pretest survey. The question asked, “During the past 30 days, on how many days did you have at least one drink of alcohol?” Response options included “0 days,” “1 or 2 days,” “3 to 5 days,” “6 to 9 days,” “10 to 19 days,” “20 to 29 days,” and “All 30 days”. Responses were scored from 0 (0 days) to 6 (all 30 days).

*Demographic characteristics.* Demographic characteristics included measures of age, gender, and race/ethnicity. *Gender* was coded as 1 if “male” and 2 if “female.” *Age* was measured with one item during the phone screening interview, the interviewer asked the student to indicate his/her age in years (i.e., 18-25). Race/ethnicity was measured with two items. Respondents were asked “Are you Hispanic or Latino/a?” to assess ethnicity. Response options included “No” 0, “Yes, I am Mexican, Mexican American, or Chicano/a” 1, and “Yes, I am some other Hispanic or Latino/a ethnicity not listed here” 2. Respondents were also asked “What race or races do you consider yourself to be? Check all that apply.” Response options included “White,” “Black or African American,” “Asian,” “American Indian or Alaska Native,” “Native Hawaiian or other Pacific Islander,” and “Other.” A race/ethnicity variable was created by combining these two questions. All students who reported being of Hispanic or Latino/a ethnicity were given a code of Hispanic and the remaining students were given codes that represented the race chosen on the question that assessed race. Students who indicated more than one race were coded as other.

*Analysis.* Statistical analyses were performed using the Statistical Package for the Social Sciences (version 22, 2013, IBM inc.). Descriptive statistics were run for age, sex, ethnicity and past 30 day alcohol use. Separate paired sample t-test models were run to examine change in the mean level of intention to use alcohol in the next 30 days, and mean level of appropriateness of individual “reasons to drink” statements between the pretest and posttest surveys. Non-parametric Wilcoxon Signed Rank tests were also run with each dependent variable to assess within participant changes from pre to post survey responses. One outlier was found who increased his/her intention to use alcohol from “Definitely Not” 1 to “Definitely Yes” 4. Separate paired t-test and Wilcoxon signed rank tests were conducted with and without the outlier included in analysis in order to gain a complete understanding of our findings. A Bonferroni familywise error rate correction was used ( $p < 0.008$ ) to correct for error associated with multiple tests conducted with reasons to drink alcohol attitude items. Missing data ranged from 1% to 3% so individual models vary in sample size.

## Results

Table 1 shows the demographic characteristics of our sample. A majority of the participants were female (72%) and about one third were white (34%), and the average age was 21 years old. Approximately 75% of our sample reported having at least one drink in the past 30 days (40% of these students were underage n=30).

<b>Table 1. Demographic characteristics and past 30 days alcohol consumption of college students (N=100)</b>			
Ethnicity	<i>N</i> (%)		
White	33 (33.7)		
Hispanic	31 (31.6)		
Asian	23 (23.5)		
Other	11 (11.2)		
Gender			
Female	71 (72.4)		
Past 30 Day Alcohol Use*	74 (75.5)		
Past 30 Day Underage Alcohol Users*	30 (40)		
	Mean	SD	CI
Age	20.92	1.92	(20.57,21.32)

Results of the paired sample t-test and Wilcoxon Signed Rank test initially indicated a statistically significant increase from pre to post level of intention to use alcohol in the next 30 days ( $p < 0.05$ ; Table 2). However, additional analyses that excluded the one outlier resulted in non-significant findings, although the p-value approached significance ( $p < 0.09$ ; Table 2). When examining the six reasons for use items, only “to feel less stressed” decreased significantly from the pre to post test. All of other the other five reasons were non-significant.

<b>Table 2. Paired Sample T-Test and Wilcoxon Signed Rank Test Comparing Pre- and Post-test Alcohol Intention and Attitude Scores among College Students (N=100)</b>										
Outcomes	N	Mpre	SDpre	Mpost	SDpost	T	Sig	Std. Mean Diff	Wilcoxon Signed Ranks Test Z-Score	Sig
<b>30-day Intentions</b>	<b>98</b>	<b>2.83</b>	<b>1.22</b>	<b>2.93</b>	<b>1.18</b>	<b>-1.99</b>	<b>0.04</b>	<b>-0.20</b>	<b>-1.96</b>	<b>0.05</b>
30-day Intentions (w/o Outlier)	97	2.85	1.21	2.92	1.18	-1.71	0.09	-0.17	-1.69	0.09
Working Hard*	99	5.42	1.38	5.48	1.21	-0.51	0.60	-0.05	-0.16	0.86
Good Time w/ Friends*	99	6.01	1.07	5.96	1.22	0.53	0.59	0.05	-0.36	0.71
Celebrate*	97	6.14	0.87	6.13	1.08	0.11	0.91	0.01	-0.25	0.80
Outgoing*	99	5.64	1.29	5.43	1.47	1.58	0.11	0.15	-1.47	0.13
Connect Socially*	99	5.59	1.36	5.38	1.53	1.50	0.13	0.15	-1.18	0.23
Feel less stress*	<b>99</b>	<b>5.21</b>	<b>1.46</b>	<b>4.87</b>	<b>1.64</b>	<b>3.44</b>	<b>0.00</b>	<b>0.39</b>	<b>-3.81</b>	<b>0.00</b>

## **Discussion**

This study examined the influence of alcohol advertisements on young adult intentions to use alcohol. Alcohol commercials embedded in a popular TV show were used in an experimental design to assess change in intention to use alcohol among college students aged 18 to 25 years. Our findings suggest there is at least a temporary increase in the intention to use alcohol. Removing an outlier in our data still suggested an increase in intentions that approached significance after exposure to only four alcohol commercials in one sitting. While limited data provide estimates for the amount of alcohol commercials young adults are exposed to, there are good data for youth exposure. Jernigan and colleagues (2010) estimate a total of about 7,800 airings of alcohol TV commercials in 2010 during programs for underage youth within the top five U.S. markets. This accounts for anywhere between 13 and 32 thousand youth exposures to alcohol commercials, depending on the amount of youths in each market (Jernigan, Ross, McKnight-Eily, & Brewer, 2010). Young adults are exposed to at least this many alcohol commercials, if not more. Moreover, it is important to consider our findings after exposure to only four alcohol commercials given that this is probably far less than the typical exposure in a given day.

After exposure to the TV advertisements, participants reported that, “to feel less stress” was a significantly less appropriate reason why people their age drink alcohol. This is an interesting finding, because while the two beer commercials did not explicitly depict their products as stress relievers they did show individuals enjoying recreational

activities (i.e., barbequing, camping, and music festivals), which may have suggested that using the product would result in less stress. Due to the lack of previous research examining short term influences of exposure to TV alcohol advertising it is difficult to determine why our other attitude variables did not change. A possible reason is that we did not include measurements of salient attitudes influenced by the commercials presented in the study. Further studies are needed which examine a wider range of reasons to use alcohol to determine if there are other important outcomes young adults associate with alcohol use. While social interactions (Ham, 2009; LaBrie, Hummer, & Pedersen, 2007) and social conformity (O'Hara & Armeli, 2015) have been found to be associated with reasons why college students drink no research has determined if exposure to alcohol advertisements influences these specific social reasons for alcohol use.

Future research should focus on specific TV programs that may be particularly attractive to young adults and that have high rates of alcohol advertising, such as sporting events. The majority of alcohol advertising dollars are spent on commercial slots during sports programs. According to the Center on Alcohol Marketing and Youth (CAMY, 2003) between 60.3% and 61.5% of alcohol advertising spending between 2001 and 2003 were for advertisements during sports programs. Furthermore, nearly \$540 million were spent on TV advertisements during college sports programs in 2003. During the first quarter of 2015, ESPN, a popular sports network, accounted for more than 14,300 alcohol advertisement impressions on youth age 2 to 20 (Ross et al., 2016). Sports programming is particularly important as many young adults admire sports stars and may associate sports



events with alcohol products. Examining exposure to a variety of alcohol commercials during different programs may help determine influences on attitudes among young adults.

There are several strengths to this study. Our study was one of the first to examine short term influences of exposure to alcohol advertisements with a pretest-posttest experimental design. Moreover, we used commercials embedded during a TV show that is popular among our sample in order to closely replicate a typical viewing experience. Despite an outlier, the experimental design of our study provided additional evidence for a causal link between exposure to alcohol TV advertisements and intentions to use alcohol among young adults.

While our study had many strengths it is important to consider the limitations. We found that alcohol advertising exposure influenced intentions, however, exactly how commercials influenced intentions is unclear. Future qualitative work would allow for young adults to describe what they were thinking and feeling during commercials. Eye-tracking studies which document what young adults attend to during commercials would also provide a deeper understanding of the influence of alcohol advertising. Our study was relatively small with 100 participants and exposure to only four alcohol commercials. We suggest future studies examine specific messages with a greater number of alcohol TV commercials to determine which messages are particularly effective in influencing young adult perspectives, beliefs, attitudes, intentions and ultimately behaviors. For example, Morgenstern and colleagues (2015) classified specific alcohol advertisement content including humor and comradery as youth oriented and these

themes could hold true for young adults. Additionally, as a result of our study design, the participants were asked to pay attention to the commercials, thus we measured the central route of the Elaboration Likelihood Model (Petty, Cacioppo, and Schumann, 1983). It may be useful to also measure persuasion via the peripheral route as it is common for viewers to work on other tasks while casually viewing TV. Despite these limitations, our study contributes to public health literature by suggesting a causal relationship between exposure to alcohol TV advertising and intentions to use alcohol among college students. From a public health perspective, having knowledge of the influences of alcohol commercial messages may help inform counter-marketing strategies to reduce the impact on young adults.

## References

- Ajzen, I. (1985). *From intentions to actions: A theory of planned behavior* (pp. 11-39). Springer Berlin Heidelberg.
- Anderson, P., De Bruijn, A., Angus, K., Gordon, R., & Hastings, G. (2009). Impact of alcohol advertising and media exposure on adolescent alcohol use: a systematic review of longitudinal studies. *Alcohol and alcoholism*, 44(3), 229-243.
- Austin, E. W., Chen, M. J., & Grube, J. W. (2006). How does alcohol advertising influence underage drinking? The role of desirability, identification and skepticism. *Journal of Adolescent Health*, 38(4), 376-384.
- Bonnie, R. J., & O'Connell, M. E. (2004). Alcohol in the Media: Drinking Portrayals, Alcohol Advertising, and Alcohol Consumption Among Youth. *National Academy of Sciences*. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK37586/>
- Center on Alcohol Marketing and Youth. (2003). *Alcohol Advertising on Sports Television 2001 to 2003*. [http://www.camy.org/\\_docs/resources/factsheets/Alcohol\\_Advertising\\_on\\_Sports\\_Television.pdf](http://www.camy.org/_docs/resources/factsheets/Alcohol_Advertising_on_Sports_Television.pdf). Accessed on February 14, 2016.
- Connolly, G. M., Casswell, S., ZHANG, J. F., & Silva, P. A. (1994). Alcohol in the mass media and drinking by adolescents: a longitudinal study. *Addiction*, 89(10), 1255-1263.

- Engels, R. C. M. E., Hermans, R. C. J., Baaren, R. B. v., Bot, S. M., & Hollenstein, T. (2009). Alcohol portrayal on television affects actual drinking behaviour. *Alcohol and Alcoholism*, 4(3), 244-249. doi:10.1093/alcalc/agp003
- Fisher LB, Williams Miles I, Austin B et al. (2007) Predictors of initiation of alcohol use among US adolescents findings from a prospective cohort study. *Arch Pediatr Adolesc Med* 161:959–66.
- Fleming, K., Thorson, E., & Atkin, C. K. (2004). Alcohol advertising exposure and perceptions: Links with alcohol expectancies and intentions to drink or drinking in underaged youth and young adults. *Journal of Health Communication*, 9(1), 3. doi:10.1080/10810730490271665
- Ham, L. S. (2009). Positive social alcohol outcome expectancies, social anxiety, and hazardous drinking in college students. *Cognitive Therapy and Research*, 33(6), 615-623. doi:10.1007/s10608-009-9248-8
- Henriksen L, Feighery EC, Schleicher NC et al. (2008) Receptivity to alcohol marketing predicts initiation of alcohol use. *J Adolesc Health* 42:28–35
- IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.
- Jernigan, D. H., Ross, C. S., McKnight-Eily, L. R., Brewer, R. D., & Centers for Disease Control and Prevention (CDC). (2013). Youth exposure to alcohol advertising on

television--25 markets, united states, 2010. *MMWR. Morbidity and Mortality Weekly Report*, 62(44), 877.

Kuo, M., Wechsler, H., Greenberg, P., & Lee, H. (2003). The marketing of alcohol to college students: the role of low prices and special promotions, *American journal of preventive medicine*, 25(3), 204-211.

LaBrie, J. W., Hummer, J. F., & Pedersen, E. R. (2007). Reasons for drinking in the college student context: The differential role and risk of the social motivator. *Journal of Studies on Alcohol and Drugs*, 68(3), 393-398.  
doi:10.15288/jsad.2007.68.393

Lebel, C., & Beaulieu, C. (2011). Longitudinal development of human brain wiring continues from childhood into adulthood. *Journal of Neuroscience*, 31(30), 10937-10947. doi:10.1523/JNEUROSCI.5302-10.2011

López-Caneda, E., Cadaveira, F., Crego, A., Doallo, S., Corral, M., Gómez-Suárez, A., & Rodríguez Holguín, S. (2013). Effects of a persistent binge drinking pattern of alcohol consumption in young people: A follow-up study using event-related potentials. *Alcohol and Alcoholism (Oxford, Oxfordshire)*, 48(4), 464.

McClure AC, Stoolmiller M, Tanski SE et al. (2009) Alcohol branded merchandise and its association with drinking attitudes and outcomes among US adolescents. *Arch Pediatr Adolesc Med* in press.

- Morgenstern, M., Schoeppe, F., Campbell, J., Braam, M. W. G., Stoolmiller, M., & Sargent, J. D. (2015). Content themes of alcohol advertising in U.S. Television—Latent class analysis. *Alcoholism: Clinical and Experimental Research*, 39(9), 1766-1774. doi:10.1111/acer.12811
- Norberg, M. M., Norton, A. R., Olivier, J., & Zvolensky, M. J. (2010). Social anxiety, reasons for drinking, and college students. *Behavior Therapy*, 41(4), 555-566. doi:10.1016/j.beth.2010.03.002
- O'Hara, R. E., Armeli, S., & Tennen, H. (2015). College students' drinking motives and social-contextual factors: Comparing associations across levels of analysis. *Psychology of Addictive Behaviors : Journal of the Society of Psychologists in Addictive Behaviors*, 29(2), 420-429. doi:10.1037/adb0000046
- O'Keefe D. (2013) The Elaboration Likelihood Model. *The SAGE Handbook of Persuasion : Developments in Theory and Practice*.137-149.
- Pasch KE, Komro KA, Perry CL et al. (2007) Outdoor alcohol advertising near schools: what does it advertise and how is it related to intentions and use of alcohol among young adolescents? *J Stud Alcohol Drugs* 68:587–96.
- Perkins, H. W. (2002). Surveying the damage: A review of research on consequences of alcohol misuse in college populations. *Journal of Studies on Alcohol, supplement*, (14), 91-100.

- Petty, R. E., Cacioppo, J. T., & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research*, 10(2), 135-146. doi:10.1086/208954
- Robinson, T. N., Chen, H. L., & Killen, J. D. (1998). Television and music video exposure and risk of adolescent alcohol use. *Pediatrics*, 102(5), e54-e54.
- Ross, C. S., Brewer, R. D., & Jernigan, D. H. (2016). The potential impact of a "no-buy" list on youth exposure to alcohol advertising on cable television. *Journal of Studies on Alcohol and Drugs*, 77(1), 7.
- Ross, C. S., Maple, E., Siegel, M., DeJong, W., Naimi, T. S., Padon, A. A., ... & Jernigan, D. H. (2015). The relationship between population-level exposure to alcohol advertising on television and brand-specific consumption among underage youth in the US. *Alcohol and Alcoholism*, 50(3), 358-364.
- Saffer H. (2002) Alcohol advertising and youth. *J Stud Alcohol* S14:173–81.
- SAMHSA, CBHSQ. (2013). 2013 Tables: Miscellaneous - 6.55 to 6.107 (PE). Retrieved January 6, 2016, from <http://www.samhsa.gov/data/sites/default/files/NSDUH-DetTabsPDFWHTML2013/Web/HTML/NSDUH-DetTabsSect6peTabs55to107-2013.htm#tab6.88b>
- Sargent JD, Willis TA et al. (2006) Alcohol use in motion pictures and its relation with early-onset teen drinking. *J Stud Alcohol* 67:54–65.

- Smith, L. A., & Foxcroft, D. R. (2009). The effect of alcohol advertising, marketing and portrayal on drinking behaviour in young people: systematic review of prospective cohort studies. *BMC public health*, 9(1), 51.
- Snyder LB, Fleming-Milici F, Slater M et al. (2006) Effects of alcohol advertising exposure on drinking among youth. *Arch Pediatr Adolesc Med* 160:18–24.
- Stacy, A. W., Zogg, J. B., Unger, J. B., & Dent, C. W. (2004). Exposure to Televised Alcohol Ads and Subsequent Adolescent Alcohol Use. *American Journal of Health Behavior*, 28(6), 498–509. <http://doi.org/10.5993/AJHB.28.6.3>
- Strickland, D. E. (1984). The advertising regulation issue: Some empirical evidence on alcohol advertising and teenage consumption patterns. *Control Issues in Alcohol Abuse Prevention: National, State and Local Designs for the*, 80.
- Townshend, J. M., Kambouropoulos, N., Griffin, A., Hunt, F. J., & Milani, R. M. (2014). Binge Drinking, Reflection Impulsivity, and Unplanned Sexual Behavior: Impaired Decision-Making in Young Social Drinkers. *Alcoholism: Clinical and Experimental Research*, 38(4), 1143–1150. <http://doi.org/10.1111/acer.12333>
- Van den Bulck, J., & Beullens, K. (2005). Television and music video exposure and adolescent alcohol use while going out. *Alcohol and Alcoholism*, 40(3), 249-253.
- Wechsler, H., Davenport, A., Dowdall, G., Moeykens, B., & Castillo, S. (1994). Health and behavioral consequences of binge drinking in college: A national survey of students at 140 campuses. *Jama*, 272(21), 1672-1677.



- Wechsler, H., Lee, J. E., Kuo, M., & Lee, H. (2000). College binge drinking in the 1990s: A continuing problem results of the Harvard School of Public Health 1999 College Alcohol Study. *Journal of American College Health*, 48(5), 199-210.
- White, A., & Hingson, R. (2014). The burden of alcohol use: Excessive alcohol consumption and related consequences among college students. *Alcohol research: current reviews*, 35(2), 201.
- Wills, T. A., Sargent, J. D., Gibbons, F. X., Gerrard, M., & Stoolmiller, M. (2009). Movie exposure to alcohol cues and adolescent alcohol problems: a longitudinal analysis in a national sample. *Psychology of Addictive Behaviors*, 23(1), 23.